

Lunabotics 2024 Frequently Asked Questions (FAQ)

The responses are based on the Lunabotics 2024 Guidebook – DRAFT Ver 1.0 dtd 09.01.2023. The Guidebook and the FAQ's are one document, if there is a conflict, let us know at KSC-Lunabotics@mail.nasa.gov

SECTION 508 OF THE REHABILITATION ACT OF 1973 AS AMENDED IN 1998

This is a draft document only. The working document is currently undergoing the review as required in Section 508 of the Rehabilitation Act of 1973 as amended in 1998. Once the review is complete, it will be uploaded to the [Lunabotics Website](#) and replace this Lunabotics 2024 FAQ with the approved Lunabotics 2024 FAQ

(FAQ's) VER 1.0

Q1 - Section 4.1.1 - The envelope height limit given is 0.75 m, and the rules say the robot cannot extend 1.5 m beyond it, totaling 2.25 m, but it also says that would be 2.5 m above the regolith. How do we interpret this height limit? Does the extension apply to the envelope height or does it apply to the actual robot height (e.g. Robot height of 0.65 m = deployable height of 2.15 m)?

A1 - Robot(s) shall be contained within a payload envelope measuring 1.50 m length x 0.75 m width x 0.75 m height with a maximum mass of 80kg. It may deploy or expand beyond the envelop after the start of each attempt but may not exceed 1.75 m in additional height which is 2.5 m above the surface of the regolith (dimensions correspond to the typical payload volume available on today's Lunar landers that are commercially available).

Q2 - Section 4.1.1 & 6.3 - The figure in section 6.3 provides dimensions of 1.5 m x 0.75 m x 0.75 m, while the requirements in section 4.1.1 state that the dimensions should be 1 m x 0.75 m x 0.75 m. What is the correct dimensional constraint?

A2 – See Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Section 6.1 and Section 10.1.4.1. The correct dimension is (1.5 m x 0.75 m x 0.75 m).

Q3 - Section 6.1.2 - Can the central hoist point and the four lifting points be detachable or movable? If they can be detachable, do they count toward the mass limit?

A3 – Yes, the central hoist point and the four lifting points can be detachable or movable. They do not count towards the mass limit. They are considered Ground Support Equipment (GSE).

Q4 - Section 4.1.10 - The team may decide to use battery cell monitoring leads to read voltage for an under-voltage protection circuit. This, theoretically, would not have its power cut with the emergency stop button. Would this be allowed under the current rules?

A4 - See Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Section 10.1.6 “Only onboard laptop computers and data-logger(s) may stay powered on if powered by its own, independent, internal computer battery. For example: it is acceptable to have a small battery onboard that only powers a Raspberry Pi control computer, and whose power does not flow through the main robot kill switch.” Yes, this would be allowed, as long as it is not connected to the main power battery.

Q5 - Section 4.2.5 - What constitutes a far-reaching mechanism? Is there a maximum reach for any component?

Lunabotics 2024 Frequently Asked Questions (FAQ)

A5 - See Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Section 6.2.5. There are too many permutations, tell us your proposal and why you think it may be in conflict with Section 6.2.5. We can move forward from there. The intent of the rule is to prevent a Lunabot from parking and deploying long arms while never moving. The Lunabot must move and be self-supporting.

Q6 - Section 4.2.6 - Does the beacon/target weight limit not apply in any situation since it refers to the attachment to a sieve, which does not exist in the current competition format?

A6 – See Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Section 6.2.6.

Section 6.2.8: “The mass of the navigational aid system is included in the maximum mining robot mass limit of and must be self-powered”

Q7 - Section 5.9 & 6.3 - The figure in section 6.3 provides craters of diameter 0.5 m, but the arena specifications in section 5.9 state that craters will be no wider than 40 cm. What are the dimensions we should expect for craters?

A7 - See Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Section 7.6, Section 7.7 and Section 8.3. Crater width = 40-50 cm.

Q8 - Section 6 - Are obstacles allowed to be part of the berm volume? Are prefabricated berm structures allowed to be part of the berm volume?

A8 – 2.The obstacles may only be pushed to the side of the arena in the Excavation Zone. There are no obstacles in the Construction Zone. This is an error in the guidebook and will be corrected. Obstacles may be part of the berm volume, but only from the Excavation Zone. Prefabricated berm structures are not allowed to be part of the berm – regolith simulant from the arena must be used.

Q9 - Section 8.2 & 8.3.2 - The score calculator in section 6.2 says the points per cubic meter of berm volume will be 25,000, while section 6.3.2 states the points per cubic meter of berm volume will be 1,000 past 0.026 cubic meters. Which scoring method is accurate? Will there be any points gained for simply hitting the 0.026 cubic meter volume, if that method is used?

A9 – During each competition attempt, the team will earn construction points for each cubic meter of berm constructed above grade. There is no minimum threshold of 0.026 cubic meters.

Q10 - Section 6.4.4 - Will the berm volume be displayed as opposed to mass this year?

A10 – Yes, the berm volume will be displayed after it has been scanned and calculated.

Q11 - What is the correct volume the 1x.75x.75 outlined in section 4.1.1 or the 1.75x.75x.75 outlined in 8.1.4.2.?

A11 – This has been corrected. See Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Section 6.1 and Section 10.1.4.1.

Q12 - What is the correct timeline the one on the website or the one on the rules?

A12 - This has been updated. See Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Section 2.

Q13 - What scoring metric is correct for the berm points the 25000 points/m³ in the construction points calculator or the 1000 points/m³ in 3.2

A13 -

Lunabotics 2024 Frequently Asked Questions (FAQ)

Q14 - It lists that we must have a hoist point for a crane above the center of gravity on the robot what are the requirements of this?

A14 - See Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Section 6.1.2. Let's think on this. The lifting point is the point at which lifting gear connects with the load it is hoisting. Ensuring that these are securely attached is a critical step in preventing injuries and property damage when using these devices. Please design accordingly, you may have to explain it on your systems engineering paper.

Q15 - How loose with the material in the excavation zone be (will front loader designs be viable).

A15 - Read the Lunabotics 2024 Guidebook – Draft Ver 1.0, dated Sep 01, 2023, Appendix B. Glossary of Terms Item 9. Black Point-1.

Q16 - Is the minimum berm the .013 m³ in 4.6.1 or the .023 m³ in 3.2

A16 - During each competition attempt, the team will earn construction points for each cubic meter of berm constructed above grade. There is no minimum threshold of 0.026 cubic meters.

Q17 - What are the categories for autonomy

A17 - See Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Section 9. Autonomy.

Q18 - The rules state that there will be BP-1 used at KSC and LHS-1 used at UCF. We just wanted to clarify that this is accurate before we begin designing our bot to the needs of driving on two separate materials.

A18 – It is accurate, please see Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Glossary of Terms, definitions 6 and 10. No issues this is a good example of applying sound engineering practices and principles.

Q19 - The rules seemingly do not explicitly state that dumping cannot be done from the mining zone. We wanted clarification on whether or not we would be able to do this or not. Additionally, if dumping is not permitted in the mining zone, does the bot have to be fully in the construction zone, or does being partially in it count.

A19 -

Q20 - Lastly, in the rules it states that the orientation of the 3 dimensions of the bots can be decided by the teams as long as it is stated to the judges. It also states in the rules that a height of 1.5m after the bot starts becomes the new maximum height. I wanted to know if this is specific to height only, or if it only pertains to whichever dimension, we dedicate to being our 1.1m length side.

A20 – I can see the confusion, but this is specific to height only. See Lunabotics 2024 Guidebook – Draft Ver 1.0, dtd 09.01.2023 Section 10.4.1.

Q21 - The current listed date will affect these teams' ability to compete as well as the ability to travel to Central Florida. Our finals week is May 11th-17th. Would it be possible to push back the in-person competition at least one week to accommodate?

A21 - Read the Lunabotics 2024 Guidebook – Draft Ver 1.0, dated Sep 01, 2023. Per Section 1.9 of our FAQ, we do not honor requests to change dates., “1.9 - Frequently Asked Questions / Ask For Help. There will be no response to requests for information already contained in the Guidebook, to change a date(s), to change/waive a deadline, a rule or a rubric.” We understand that the Competition week conflicts with your school's finals, however we can't change the dates for this year's competition for many logistical reasons. Many institutions have policies which allow students to take their finals early or late if they

[Lunabotics 2024 Frequently Asked Questions \(FAQ\)](#)

have to travel for an event related to a school club/team, such as a robotics team participating in a NASA challenge or presenting a paper at an international conference. We encourage you to reach out to your academic institution to see if such policies are available for your team. We are in the process of acquiring feedback to determine the best time for future competitions, however.

Q22 - ELIGIBILITY, DELIVERABLES, APPLICATION, Eligibility 3.1.3 - Does this intend to state that both 2 undergraduate students AND ALSO 2 graduate students are needed on a team, or is it a typo and is intended to say "...a minimum of (2) undergraduate students OR graduate students...".

A22 - 3. ELIGIBILITY, DELIVERABLES, APPLICATION, Eligibility 1.3 " The team shall be composed of enrolled undergraduate and graduate students ..." is changed to read "Teams shall: be composed of enrolled undergraduate and graduate students and shall include at least two undergraduate students ..."

*** // ***